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The Study of Qualitative Factors Influencing on Honey Consumers Demand: Application of Hedonic Pricing Model in Khorasan Razavi Province

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Abstract: In this study surveyed the consumers demand for qualitative factors of honey by using the Hedonic Pricing (HP) model and a cross section data of 360 consumer in Mashhad. Results showed that the kind (without wax), packing, color (dark), scent (scented) and protraction of honey have direct effect on honey price and sweetness (much) and existence of remains (dust and so on) have negative effect on it. This study has recommended the applied research for making honey without wax, with suitable and interesting packing, dark color, scented, less and normal sweetness, much protraction and any pollution (like dust and remains).

Key words: Honey, qualitative factors, hedonic pricing model

INTRODUCTION

Honey is the first and oldest sweetmeat which human have been used. It contains of the sugars (i.e., glucose and fructose) and mineral matters like Mg, K, Ca, NaCl, S, Fe and P. It also concludes vitamins like B1, B2, B6, B3, B5 and C. And a little of Cu, I, Zn. Amount of these materials, in different ratios, depends on quality and the kind of honey (Saadatmand, 1999). So, honey is one of the most important product in organic and safety agricultural economic.

According to current statistics, amount of produced honey in the world is 630000 t of 50 m colony. And Iran with 34787 t honey production from 3 m has 5.5% of the world production of honey. Khorasan Provinces with production of 421 t of honey in 2005, has the 19th rank between all the honey producer provinces of Iran. Mashhad with 173.8 t of honey has the first rank in Khorasan Province.

Now, by increasing researches on honey and understanding the advantages, consumption of honey has increased. So, honey price arise at the following of the expanded demands of it. With respect to diversification of honey in market, one of the key component of determining the honey price is quality of it. For studying of consumer preferences, quality should be change to quantity amounts. So, for surveying the honey quality and effects on the price, one of the good, simple and practical methods, is awareness of consumer interests for selection of honey. Therefore in current study, is attempted to examine the portion of each quality factor by using of Hedonic Pricing (HP) model.

There are a lot of studies about honey and the use of HP model. Abebini and Asgari (2005) inspected the place of export, import, market and price of honey in Iran. Ghorbani (1996) used HP model for rice and indicated the qualitative factors, like scent, on rice price. Ghorbani and Mirbemani (2005) used HP model for bean and showed the qualitative factors (color, purity, cooking degree, packing and breakage percent) on demand and price of beans. Timoty and Jeffrey (1995) also applied HP model for sperm pricing. They showed that milk amount, protein, lipids, body capacity and estrous numbers are the effective factors on sperm price. Pardoe and Durham (2003) showed that suitably chosen graphical methods can provide insights into which of a set of competing models is most useful for different subsets of the data. Dalton (2004) indicated that neither individual model encompassed the mean effects of the other, thereby justifying an augmented model consistent with the household modeling literature. Overall findings from this regression have important implications for national and international institutes engaged in developing new plant varieties for small-scale producers. Latinopoulos et al. (2004) utilized hedonic price method to reveal the implicit value of irrigation water by analyzing agricultural land values in Chalkidiki, a typical rural area in Greece. Results showed that apart from typical value attributes, the agricultural characteristics of the land, including irrigation water availability, have a significant influence on land prices. Chakraborty and Ethridge (1999) used hedonic price models to estimate the quality premiums and discounts for cotton from the South, Southwest and SanJoaquin Valley regions. The analysis found significant differences in

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price differentials across the regions under study for that year. Batalhone *et al.* (2002) used hedonic price method to estimate the economic impact of a strong smell originated from a sewage treatment plant, located in the north portion of the city of Brasília, Brazil. This study showed that there is a considerable reduction in property market values due to the presence of that environmental bad.

With respect to effects of quality factors on price of honey, this study used the hedonic pricing model. Results of this study can use for increasing the honey production with suitable qualitative components. This process could arise price of honey and income of honey producers.

MATERIALS AND METHODS

Data: In this study for studying the honey prices and qualitative factors, 360 questionnaires are filled in Mashhad honey shops in 2006. After classification and coding of the questions (quantify the qualitative factors), we estimated the consumers demand function (hedonic pricing of honey).

Method: As the price of honey is related to its quality, Hedonic Pricing (HP) model will be useful for identify the quality of honey and it's effect on price. This model is introduced according to Becker (1965), Rosen (1974) and Lancaster (1966). It consists of the regression of goods price on qualitative characteristics (Lucas, 1975). So, HP will use for determining demand of goods that are function of their characteristics.

Let Y as a product (goods), so production function is:

$$Y = f(Z) \tag{1}$$

And Z is the vector of input characteristics. With assuming maximization of profit by the firm, we have:

$$\pi = pf(Z) - WX \tag{2}$$

where, p is the price of product, W the vector of input prices and X is the vector of inputs. The first order condition for maximizing profit is:

$$\frac{\partial \pi}{\partial \pi} = p\Sigma\left[\frac{\partial f}{\partial Z_j} \cdot \frac{\partial Z_j}{\partial X_i}\right] - W = 0 \tag{3}$$

And for every particular input, Eq. 3 is written to Eq. 4, so:

$$W_i = \Sigma\left[T_j \cdot \frac{\partial Z_j}{\partial X_i}\right] , \qquad T_j = p.\frac{\partial f}{\partial Z} \tag{4}$$

where, T_j is the marginal value of the jth factor.

So, Eq. 4 is the hedonic pricing model. And it is used for determining the marginal value of qualitative characteristics.

Empirical model for honey: In current study, linear form is used for estimating hedonic pricing model of honey:

$$p = \alpha + \Sigma^7_{i=1} \beta_i X_i + U_i \tag{5}$$

where, p is honey price, X_1 is the kind of honey (with wax = 0, without wax = 1), X_2 is influence of honey packing on consumers (without influence = 0, with influence = 1), X_3 is sweet order of honey (normal and little sweet = 0, very sweet = 1), X_4 is the color of honey (light = 0, dark = 1), X_5 is the scent of honey (scented = 0, with out scent = 1), X_6 is the degree of protraction and separation (little protraction = 0, much protraction = 1), X_7 is existence of insect wing and dust (being = 0, not being = 1), U is residual term, α and β_i (i = 1,2,3,...,7) are regression parameters that must estimate.

RESULTS AND DISCUSSION

Sample descriptive: The kind of honey is one of the qualitative characteristics that influence on price. 76.7% of consumers bought the honey without wax and the 23/3%, preferred honey with wax. So, the main demand of market is honey without wax. Packing is a very important service in marketing. 93.3% of consumers expressed that packing of honey is very important factor for buying it. 86.6% of people preferred honey with normal and less sweet. In the other word, market demand for less sweet honey is more than much sweet one. Honey color defines the natural situation of producing it (the kind of flower and plant). 63.3% of the sample, preferred the light honey and the others preferred dark ones. Eighty percent of Mashhad's consumers, selected the scented honey and just 20% expressed that they like honey without scent. So, market demand depends on the scented honey. Eighty percent of the sample, choose the honey with high protraction. So, higher price should be on more viscous honey. Existence of dust and remains of insect body have negative effect on consumer demand and price of honey. In this study, major of the buyers (93.3%) expressed that dust and remains didn't exist in their honey.

Price of honey: Table 1, shows the price of 400 g honey with different qualities. 16.6% of people bought the honey in 16000 rials (R); 3.3%, 15560 R; 20%, 14740 R; 6.6%, 14000 R ; 6.6%, 13330 R; 20%, 12000R; 3.3%, 10530 R; 6.6%, 10000 R; 10%, 9600 R and 6.6%, 4000 R. Therefore, different prices with different characteristics are examined in the following part through the function of hedonic pricing.

Table 1: Distribution of honey price (adjusted in 400 g)

Price (rials)	No. of buyers	Percent
16000	60	16.6
15560	12	3.3
14740	72	20.0
14000	24	6.6
13330	24	6.6
12000	72	20.0
10530	12	3.3
10000	24	6.6
9600	36	10.0
4000	24	6.6

Table 2 :Results of HP model estimation

Variables	Coefficient	T-ratio
Kind of honey	1596.30	2.177*
Packing	4333.00	3.871**
Sweet degree	-1171.80	-1.385ns
Honey color	1527.20	2.595**
Scent of honey	-2804.80	-3.937**
Protraction of honey	1915.80	2.716**
Remains existence	-466.60	-0.417ns
Intercept	6391.48	3.445**
R^2	0.44	
D.W	2.30	

* Significant at 5%; ** Significant at 1%; ns: No Significant

Results of examined model: Table 2 shows that honey with wax is more expensive than the honey without it (amounts of 1596.3 rials). Packing and degree of sweet have opposite impact on honey price. In the other word, honey in modern packing and less sweet is more expensive than in traditional ones (4333 rials) and much sweet (1171.8 rials). Notice that, the sweet variable isn't significant at 5% level, but significant at 18% level. Color and scent of honey are the other variables in Table 2. According to the results, darker and scented honey is more expensive than more light and without scent honey (respectfully 1527.2 and 2804.8 rials). Viscous honey (with high viscosity) has higher price than less one. This amount is equal to 1915.8 rials. Existence of remains and dust in honey has negative impact on honey price (466.6 rials). But this variable isn't significant at 5% level.

Priority of variables, according to amount of influences on honey price: As higher coefficient has higher effect on honey price. With respect to Table 3, packing variable has the most positive effect and the remains existence variable has the least negative effect on honey price.

CONCLUSION

In this study surveyed the consumers demand for qualitative factors of honey by using the Hedonic Pricing (HP) model and a cross section data of 360 consumer in Mashhad. Results showed that the kind (without wax), packing, color (dark), scent (scented) and protraction of honey have direct effect on honey price and sweetness

Table 3: Priority of variables, according to amount of influence on honey price

Variables	Marginal value	Rank
Packing	4333.0	1
Scent	2404.8	2
Protraction	1915.8	3
Kind	1596.3	4
Color	1527.2	5
Sweet degree	1171.8	6
Remains	466.6	7

(much) and existence of remains (dust and so on) have negative effect on it. This study introduced some recommendations for improving the quality and marketing of honey as:

- As packing has the most influence on increasing honey price, so determining the preference of consumers toward the kind, picture and the form of honey packing is very important for increasing price and marketing
- As dark color of honey has positive effect on price of it and variation of flowers is the most important factor on making darker honey, so beekeepers should be careful for determining the place of hive
- Because of consumer tendency for less sweet honey, so bee feeding with sugar (that makes honey unnaturally too sweet), is recommended to prevent
- About the scent is recommended that beekeepers place the hive close the scented flowers (especially in mountains area)
- Preventing of bee feeding with solution of sugar and water, is suggested to beekeepers (avoiding little density)

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